

CLAIMS

What is claimed is:

- 1 1. A method comprising the steps of:
- 2 a) sampling at least one of a tip and a ring signal to determine a line voltage
- 3 and a line current of a linefeed component of a subscriber loop;
- 4 b) estimating an instantaneous power dissipation of the linefeed component;
- 5 c) filtering the estimated instantaneous power dissipation to generate an
- 6 estimated junction temperature.
- 1 2. The method of claim 1 further comprising the step of:
- 2 d) generating a thermal alarm, if the estimated junction temperature exceeds an
- 3 alarm threshold.
- 1 3. The method of claim 2, further comprising the step of:
- 2 e) timesharing a same monitoring circuitry to perform steps a)-d) for each
- 3 linefeed driver component being monitored.
- 1 4. The method of claim 1 further comprising the step of:
- 2 d) programming a filter with filtering parameters corresponding to thermal
- 3 characteristics of the linefeed component.
- 1 5. A method comprising the steps of:
- 2 a) selecting a selected linefeed component of a plurality of linefeed
- 3 components coupled to a subscriber loop having a tip signal and ring signal;

- 4 b) sampling at least one of the tip and the ring signals to determine a voltage
5 and a current associated with the selected linefeed component;
6 c) estimating an instantaneous power dissipation of the selected linefeed
7 component; and
8 d) filtering the estimated instantaneous power dissipation to generate an
9 estimated junction temperature of the selected linefeed component.

- 1 6. The method of claim 5 further comprising the step of
2 e) providing a thermal alarm indicator, if the estimated junction temperature
3 exceeds an alarm threshold.

- 1 7. A subscriber loop signal processor apparatus, comprising:
2 an analog-to-digital converter (ADC) for sampling at least one of a tip and a ring
3 signal;
4 a power calculator coupled to calculate an instantaneous power dissipation of a
5 selected linefeed driver component from the sampled signal and control currents provided
6 to a plurality of linefeed driver components; and
7 a filter providing an estimated junction temperature of the selected linefeed driver
8 component from the instantaneous power dissipation.

- 1 8. The apparatus of claim 7 further comprising:
2 a comparator providing an alarm indicator if the estimated junction temperature
3 exceeds an alarm threshold.

1 9. The apparatus of claim 7 further comprising:
2 a multiplexer coupling the at least one tip and ring signal to the analog-to-digital
3 converter to enable providing an estimated junction temperature of any of the linefeed
4 components using a same ADC, power calculator, and filter.

1 10. The apparatus of claim 9 wherein a multiplexer control is time based to enable
2 time-sharing the same ADC, power calculator, and filter for each linefeed component.

1 11. The apparatus of claim 7 wherein the ADC, the power calculator, and the filter
2 reside within a same integrated circuit package.

1 12. The apparatus of claim 7 further comprising:
2 a re-writable nonvolatile memory coupled to provide filter parameters
3 corresponding to thermal characteristics of the linefeed components to the filter.

1 (13.) A subscriber loop interface circuit apparatus comprising:
2 a signal processor having sense inputs for sensing a tip line and a ring line of a
3 subscriber loop, the signal processor generating subscriber loop control signals; and
4 a linefeed driver for driving the subscriber loop in accordance with the subscriber
5 loop control signals, the linefeed driver including a tip fuse series-coupled to the tip line
6 and a ring fuse series-coupled to the ring line, wherein the sensed tip signal includes first
7 and second sampled tip voltages sampled from opposing sides of the tip fuse, wherein the
8 sensed ring signal includes first and second sampled ring voltages sampled from opposing
9 ends of the ring fuse.

1 14. The subscriber loop linefeed driver of claim 13 wherein a difference between the
2 first and second sampled tip voltages is proportional to the tip current, wherein a
3 difference between the first and second sampled ring voltages is proportional to the ring
4 current.

1 15. A method comprising the steps of:
2 generating subscriber loop control signals in response to a sensed tip signal and a
3 sensed ring signal of a subscriber loop, wherein the tip signal is sensed before and after a
4 tip fuse, wherein the ring signal is sensed before and after a ring fuse; and
5 driving the subscriber loop in accordance with the subscriber loop control signals.

1 16. A subscriber loop interface circuit apparatus comprising:
2 a signal processor having sense inputs for sensing a tip line and a ring line of a
3 subscriber loop, the signal processor generating subscriber loop control signals; and
4 a linefeed driver for driving the subscriber loop in accordance with the subscriber
5 loop control signals, the linefeed driver including a tip fuse series-coupled to the tip line
6 and a ring fuse series-coupled to the ring line, wherein the tip line and ring line are each
7 sensed at two locations to determine both a status of each fuse and a power dissipation of
8 each linefeed driver component.